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REMARKS

Entry of the forgoing amendments and favorable consideration of the subject application in the light thereof, and in the light of the following remarks, are respectfully requested.

By the present amendments, independent claims 1 and 12 have been amended to recite that the molecular weight is a number average molecular weight. It is believed this amendment overcomes the Examiner's §112 rejection as discussed below. Furthermore, independent claims 1 and 12 have been amended to further recite a viscosity range for the binder solution. This amendment overcomes the Examiner's double patenting rejection since there is no longer any overlap of claimed subject matter with U.S. patent number 6,331,350, as discussed below. It is submitted that proper support for the amendments does exist in the application as originally filed, and therefore entry of the amendments are respectfully requested.

Initially, the Examiner is thanked for the most fruitful and courteous interview afforded the undersigned local counsel, and Dr. Diana Fisler, on October 28, 2004. A summary of the discussions and the arguments presented at the interview is provided below in addressing each of the outstanding rejections of record.

§ 112 Rejection -

The Examiner has rejected claims 1, 5, 7, 8, 10, 11, 15, 17, 18 and 20 under 35 U.S.C. §112, second paragraph. This rejection is due to the recitation of the phrase "molecular weight". It is maintained by the Examiner that it is not readily ascertainable as to whether "weight average" or "number average" is intended.

The molecular weight is a number average molecular weight, as discussed at the interview. This is noted in Table 1 of the present specification, as the molecular weight measured in Daltons. As discussed at the interview, Daltons are known to be a measure of molecular weight, for example, as noted in the article, "Birth of a New Macromolecular Architecture: Dendrimers as Quantized Building Blocks for Nanoscale Synthetic Organic

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Chemistry" by Donald A. Tomalia of Central Michigan University, Aldrichimica Acta, volume 37, No. 2, 2004. A copy of the relevant pages of this article is attached hereto. Note in particular the highlighted portions on pages 41 and 43 of the article, wherein molecular weights are expressed in terms of "Daltons". Furthermore, U.S. Patent No. 5,932,665 discusses the molecular weight of polymers in terms of Daltons. The '665 patent is also attached hereto for the convenience of the Examiner. In particular, the Examiner's attention is directed to column 8, lines 11-16 of the '665 patent, wherein Daltons are noted as a "number average" molecular weight.

Thus, it is submitted that one skilled in the art would understand that "Daltons" refer to a method of determining the number average molecular weight in accordance with the understanding of the industry, e.g., as described in the Aldrichimica Acta article, and in U.S. Patent No. 5,932,665. The skilled artisan would understand the intended scope of the claims as written once read in light of the specification, and in light of the knowledge of the industry.

To avoid any further ambiguity, independent claims 1 and 12 have been amended to recite "number average molecular weight". It is believed that the reference to Daltons in the specification is support for this amendment. It is also submitted that this amendment overcomes the Examiner's objection to the claims of record.

Therefore, favorable reconsideration and withdrawal of the Examiner's rejection under U.S.C. §112, second paragraph, are respectfully requested.

Double Patenting Rejection -

The Examiner has also rejected certain claims of record, i.e., claims 1, 7, 8 and 10-20 under the judicially created doctrine of obviousness type double patenting. The rejection is over claims 1-24 of U.S. Patent No. 6,331,350.

As discussed at the interview, the claims of the '350 patent specifically recite certain pH ranges. All claims of the '350 patent are specifically delimited by a pH limitation. None of the claims of the subject application contain a pH limitation. The Examiner acknowledged

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this, however, specific note was taken of claims 13 and 14 of the '350 patent, which also recites a specified ratio range for carboxy group equivalents to hydroxyl group equivalents. Thus, the issue of some overlap between the claimed subject matter was discussed.

In order to overcome the obviousness type double patenting rejection, and clearly distinguish the claimed subject matter of the '350 patent, independent claims 1 and 12 have now been further amended to recite a specific viscosity range. Support for this viscosity range is found in the specification, on page 17, Table 1. This viscosity range is not an inherent feature of the binder system. A Declaration Pursuant to 37 C.F.R. §132 is submitted herewith, the declaration being made by Derek C. Bristol, that in fact such a viscosity range is not an inherent feature of the binder system. The viscosity of a binder system as detailed in the attached declaration, can vary greatly outside of the range of 20 cP to 100 cP, as a viscosity depends on and can change due to many factors. The type of polycarboxy polymer used, whether a copolymer component is used, whether the polymer is more branched or more linear, and the presence of viscosity modifiers, can all ultimately determine the viscosity. As concluded by Mr. Bristol in his declaration, the viscosity of a binder composition would not necessarily be in the range of from 20 cP to 100 cP.

Accordingly, it is submitted that the claimed subject matter of the present application and the claimed subject matter of the '350 patent no longer overlap. One practicing the claimed subject matter of the '350 patent would not necessarily infringe any of the claims of the present application, and one practicing the claimed subject matter of the present application would not necessarily infringe any of the claims of the '350 patent. Therefore, it is believed that the double patenting rejection is not proper, and favorable reconsideration of the Examiner's obviousness type double patenting rejection is respectfully requested.

§§102 and 103 Rejections -

The art rejection of record is a rejection of the claims of record under 35 U.S.C. §102, or in the alternative, under 35 U.S.C. §103, over Arkens et al. (U.S. Patent No. 5,427,587), Arkens et al. (U.S. Patent No. 5,661,213), Arkens et al. (U.S. Patent No. 5,763,254), Arkens et al. (U.S. Patent No. 6,136,916), Chen et al. (U.S. Patent No. 6,274,661 B1), or EP 583068

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A1, (Arkens et al.). As discussed at the interview, however, the presently claimed invention is not specifically suggested or disclosed in the cited prior art, nor are the advantages of the claimed invention recognized, and thus requisite motivation to practice the claimed invention simply does not exist in the prior art. Favorable reconsideration of the Examiner's art rejections are therefore respectfully requested.

More specifically, the present invention relates to a novel fiberglass binder which comprises a polycarboxy polymer and a polyol. Specifically, the binder relates to a polycarboxy polymer which has a molecular weight of around 5,000 or less, and a polyol such as triethanolamine. The use of these binders, with a specified hydroxyl/carboxy ratio and low molecular weight, results in few, if any, processing difficulties when preparing a fiberglass product. Sticking and balling of the fiberglass fibers during the preparation of the fiberglass mat become of minimal concern. The resulting product has also been shown to exhibit excellent recovery and rigidity properties, as well as storage modules.

The importance of using a low molecular binder and the specified hydroxyl/carboxy ratio is discussed on page 10 on the specification, beginning with line 26. Specifically, it has been found that for the low molecular weight polycarboxy polymers, where the molecular weight of the polycarboxy polymer is less than 5,000, and preferably approaches 2,000, the ratio should approach 0.7/1 for the most advantageous results. This finding is totally unexpected in light of the prior art.

The comparative data in the specification demonstrates the importance of this molecular weight and hydroxyl/carboxy ratio relationship. For example, on page 16 of the specification, it is noted that the lowest molecular weight resin (resin D), which had a molecular weight of 2,000, with a stoichiometry of 70% (ratio of 0.7/1) gave the best acrylic bonded product performance (recovery and group).

It is submitted that there is no anticipation by the references of record and that there is no specific disclosure of a combination of the low molecular weight polymers and the specific hydroxyl/carboxyl group ratio in the prior art. The broader ranges disclosed in the prior art do not anticipate and cannot anticipate the claimed subject matter of the present

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application, as the ranges are very wide and encompass an exceedingly large amount of ratios and hence binder compositions, particularly when one considers the need to couple the hydroxyl/carboxy ratio with the molecular weight.

Attached hereto is a Declaration Pursuant to 37 C.F.R. §1.132 by Dr. Diana Fisler. In the declaration, it is noted that the disclosed hydroxyl to acid equivalents ranges in the prior art are considered very wide ranges to the skilled artisan as they encompass an exceedingly large amount of ratios and hence binder compositions, with the product quality varying enormously over the range. One working in the area of fiberglass binders would not consider these ranges as small, but would recognize each range as covering a large diverse number of compositions, particularly when one considers the combinations of a particular ratio with a molecular weight.

As discussed in the declaration, paragraph 8, there are many major changes in performance that occur throughout the disclosed ranges of the prior art, many depending on and changing with the molecular weight of the polymer used. This is not recognized or suggested in the prior art. For example, at a ratio of about 0.2, the crosslink density would be so low that a weak and nondurable binder is obtained. At a ratio of 0.5, with a low molecular weight polymer, i.e., less than 5,000, an inferior binder with respect to crosslink density is achieved, whereas at higher molecular weight, e.g., 10,000 or greater, a ratio of 0.45 to 0.50 is actually optimal. Basically, the prior art does not recognize or suggest any important connection between the polymer molecular weight and the hydroxyl/acid equivalents of the binder. The disclosure of the prior art is in fact quite broad, and therefore cannot be an anticipation under the patent laws to a skilled artisan.

With regard to the issue of obviousness, as noted above, comparative data in the specification demonstrates the unexpected importance of a low molecular weight with a particular hydroxyl/carboxy ratio. Furthermore, attached hereto is a second Declaration Pursuant to 37 C.F.R. § 1.32 from Dr. Diana Fisler. The declaration outlines scientific runs made to test the crosslink density for binder compositions having different hydroxyl/carboxy ratios. As described in paragraph 7 of the declaration, the results indicate that for a

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hydroxyl/acid ratio between 0.6 and 0.8, the best crosslink density is obtained for a low molecular weight polymer containing binder system.

It is submitted that the attached declaration of Dr. Fisler, as discussed at the interview, clearly demonstrates surprising results, surprising in that the combination of low molecular weight with the particular hydroxyl/carboxy ratio claimed in the present application is nowhere suggested or disclosed in the prior art.

As such, it is respectfully submitted that the Arkens et al. '587; Arkens et al. '213; Arkens et al. '524; Arkens et al. '916; Chen et al. '661 and EP 583086 patent references cannot anticipate or render obvious applicants claimed invention.

Favorable reconsideration and withdrawal of the Examiner's art rejection of record under 35 U.S.C. §102 and/or §103 are therefore respectfully requested.

From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order, and such action is earnestly solicited.

Respectfully submitted,

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